



भारतीय दूरसंचार विनियामक प्राधिकरण
Telecom Regulatory Authority of India

Recommendations
on
Auction of Spectrum in frequency bands identified for
IMT/5G

(Response to back reference dated 29th April 2022 received from Department of Telecommunications on TRAI's recommendations dated 11th April 2022)

9th May 2022

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CHAPTER-1: INTRODUCTION

- 1.1 The Department of Telecommunications (DoT), through its letter dated 13th September 2021, under the terms of clause 11 (1)(a) of TRAI Act, 1997 as amended by TRAI Amendment Act 2000, requested TRAI to:
- a) Provide recommendations on applicable reserve price, band plan, block size, quantum of spectrum to be auctioned and associated conditions for auction of spectrum in 526-698 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz and 24.25-28.5 GHz bands for IMT/5G.
 - b) Provide recommendations on quantum of spectrum/band, if any, to be earmarked for private captive/isolated 5G networks, competitive/transparent method of allocation, and pricing, for meeting the spectrum requirements of captive 5G applications of industries for machine/plant automation purposes/Machine-to-Machine (M2M) in premises.
 - c) Provide recommendations on appropriate frequency band, band plan, block size, applicable reserve price, quantum of spectrum to be auctioned and associated conditions for auction of spectrum for space-based communication services.
 - d) Provide any other recommendations deemed fit for the purpose of spectrum auction in these frequency bands, including the regulatory/technical requirements as enunciated in the relevant provisions of the latest International Telecommunication Union (ITU)-R Radio Regulations.
- 1.2 Subsequently, vide its letter dated 23rd September 2021, DoT informed that the Government has taken the following decisions with regard to future spectrum auctions and requested TRAI to consider/factor in the same while providing recommendations in response to DoT's earlier letter dated 13th September 2021:

- a) Rationalizing Bank Guarantees to securitize Deferred Annual Spectrum payment instalments in future spectrum auctions: For spectrum auctions held in the future, the requirement for the successful bidder to submit a Financial Bank Guarantee (FBG) of an amount equal to one annual instalment to securitize the instalment, and to submit Performance Bank Guarantee (PBG) for roll out obligations etc., will be dispensed with. DoT will also appropriately address the eligibility conditions for participation in the auction, so that the participants have sufficient financial capacity.
- b) Increase in duration of Spectrum Allocation: In future auctions, access spectrum will be assigned for a period of 30 years. However, since in past auctions the reserve prices and bids were corresponding to validity of 20 years, there will be no change in the tenure for spectrum acquired in past auctions.
- c) Regular conduct of Spectrum Auction on annual basis: Spectrum auctions will be held normally in the last quarter of every financial year. Whenever necessary, auctions can be held at shorter intervals also.
- d) Provisions for Surrender of Spectrum: In order to encourage better utilization of spectrum and to encourage business, for the auctions conducted henceforth, Telecom Service Providers (TSPs) may be permitted to surrender spectrum after a minimum period of 10 (ten) years. TSPs will have to inform one year prior to surrendering their spectrum. An appropriate surrender fee will be charged. However, the spectrum purchase dues for the remaining (post surrender) period will not be levied.
- e) No Spectrum Usage Charges (SUC) for Spectrum acquired in future auctions: For spectrum acquired in future auctions no SUC will be charged. The condition of minimum 3% weighted average SUC rate and SUC floor amount will also be removed. Guidelines will be issued by DoT to operationalize this decision.
- f) Sharing of Spectrum: In order to encourage spectrum sharing for better utilization and efficiency, henceforth spectrum sharing will

not attract an increase in the SUC rate by 0.5%. Guidelines have already been amended by DoT to operationalize this decision.

1.3 Accordingly, DoT vide its said letter dated 23rd September 2021 requested TRAI to provide its recommendations on the following also:

- a) While undertaking auction for spectrum with validity for 30 years, recommendations on associated conditions like upfront payments, applicable moratorium period after upfront payments, number of deferred payment instalments and other related modalities.
- b) For creating provisions for surrender of spectrum, conditions and fee for such surrender of spectrum.

1.4 TRAI through its letters dated 27th September 2021 and 8th October 2021, sought certain additional information/clarifications from DoT. Response to TRAI letter dated 8th October 2021 was submitted by DoT vide its letter dated 21st October 2021. Most of the information/clarifications sought vide TRAI letter dated 27th September 2021 were provided by DoT vide its letters dated 2nd November 2021, 27th November 2021 and 2nd December 2021.

1.5 As regards information on the details of the frequency bands and quantum of spectrum available in each band required to be put to auction and associated information in respect of space-based communication, through letter dated 27th November 2021, DoT informed that “...*information in respect of space-based communication services sought by TRAI vide letter dated 23.11.2021, the same will take some time. Therefore, to avoid delay in 5G roll-out, TRAI may go ahead with consultations/recommendations on issues excluding space-based communication services referred in DoT’s reference dated 13.09.2021 and 23.09.2021. Issues related to space-based communication services may be taken up separately on receipt of information from DoT*”. Therefore, a separate consultation process on the issue of spectrum for space-based communication services will be taken up by TRAI after receipt of requisite information from DoT.

- 1.6 After a detailed consultation process, the Authority submitted its recommendations on 11th April 2022 on “Auction of Spectrum in frequency band identified for IMT/5G”.
- 1.7 DoT, through its letter dated 29th April 2022 (**Annexure**), has informed that the TRAI recommendations dated 11th April 2022 were forwarded to Secretary (T), DoT and the same were considered by DoT and it has been decided as follows:
- a) There is a need to seek reconsidered recommendations from TRAI in respect of some of the recommendations. Such recommendations and the issues involved therein are enclosed as Annexure-I
 - b) On some of the recommendations, views of the DoT are enclosed as Annexure-II.
 - c) Rest of the recommendations are acceptable.
- 1.8 Accordingly, DoT through its letter 29th April 2022 has requested TRAI to provide reconsidered recommendations, in accordance with the provisions of Section 11 of the TRAI Act 1997, as amended in 2000, on recommendations listed in Annexure-I to the back-reference.
- 1.9 The Authority’s earlier recommendations, the views of the DoT thereon, and the response of the Authority on the issues listed in Annexure-I to the back reference received from DoT are given in Chapter II. Vide Annexure-II to the back reference, DoT has provided its views on some of the TRAI recommendations. It is observed that some of the views given in Annexure-II require re-examination by DoT and therefore the views of the Authority on these issues are provided in Chapter III.

CHAPTER-II: PARAWISE RESPONSE TO ANNEXURE-I

Response to issues referred back by DoT as per Annexure-I to the back-reference dated 29th April 2022

1. Spectrum availability for forthcoming auction of Spectrum

Para 6.14 of the TRAI Recommendations

6.14 The Authority recommends that in 600 MHz (APT 600 Option B1), 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz and 24.25-28.5 GHz spectrum bands, the entire available spectrum should be put to auction in the forthcoming auction. The Authority also notes that the Government is already considering assignment of spectrum to BSNL/MTNL for 5G Services.

DoT's Views

- (i) DoT is of the view that taking into account recent policy decisions on allocation of spectrum to strategic sector PSU, i.e., BSNL and considering the request of BSNL, following spectrum may be reserved for BSNL in all the 22 LSAs and be excluded from the spectrum availability for upcoming auction:
 - a. 10 MHz (paired) i.e., 612-622/663-673 MHz
 - b. 40 MHz i.e., 3630-3670 MHz
 - c. 400 MHz i.e., 24.25-24.65 GHz
- (ii) Request of NCRTC for assignment of 5 MHz (paired) spectrum in 700 MHz band for their LTE-based RRTS System is separately under process in the Department. DoT has sought recommendations of TRAI on spectrum requirements of NCRTC and sharing of same spectrum with other RRTS/metro rail networks. Accordingly, 5 MHz (paired) quantum in 700 MHz band may be reserved in 700 MHz

band and not included in the spectrum availability for the forthcoming auction.

(iii) With regard to spectrum availability in 24.25-28.5 GHz band, DoT is of the view that the auction of spectrum band 27.5-28.5 GHz may be deferred pending TRAI recommendations relating to para 7(c) of DoT reference dated 13.09.2021 regarding auction of spectrum for Space based communication services. Accordingly, spectrum availability for the forthcoming auction may be reduced for upcoming spectrum auction.

(iv) In case of surrender of spectrum by the TSPs, and spectrum reverting back to the Government from the TSPs in Corporate Insolvency Resolution Process (CIRP) etc. before the auction, total spectrum availability may vary to that extent and such spectrum may also be put to auction.

Subject to the above, entire available quantum of spectrum in 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz, 24.25-27.5 GHz bands, at the time of publication of the Notice Inviting Applications (NIA) for the forthcoming auction may be put to auction.

Response of TRAI

(i) The matter related to reserving spectrum for BSNL/MTNL is to be decided by the Government. The Government may have considered that the quantum of spectrum reserved for BSNL, specially in mid-band, is adequate with respect to the use cases of the technology being proposed to be deployed. It is also desirable that spectrum being reserved for BSNL is put to use at the earliest.

(ii) With regard to DoT reference seeking TRAI recommendations on spectrum requirements of NCRTC and sharing of same

spectrum with other RRTS/metro rail networks, TRAI is in the process of starting consultation on this issue. The Authority may form its views only after completion of the consultation process.

- (iii) DoT through its reference letter dated 13th September 2021 informed that new frequency bands have also been decided to be used for IMT/5G, wherein 27.5-28.5 GHz frequency range was also included as part of 24.25-28.5 GHz band in all the LSAs. DoT requested TRAI to provide recommendations on applicable reserve price, band plan, block size, quantum of spectrum to be auctioned and associated conditions for auction of spectrum, inter-alia, for 24.25-28.5 GHz band for IMT/5G.**

Accordingly, the Authority has given its recommendations for auction of spectrum in 24.25-28.5 GHz band, which includes 27.5-28.5 GHz frequency range, for IMT/5G and provided reserve price, band plan, block size, quantum of spectrum to be auctioned and associated conditions in its recommendation.

Vide Para 7(c) of its letter dated 13th September 2021, DoT had requested TRAI to provide recommendations on appropriate frequency band, band plan, block size, applicable reserve price, quantum of spectrum to be auctioned and associated conditions for auction of spectrum for space-based communication services.

In respect of Para 7(c), TRAI vide its letter dated 23.11.2021 asked DoT to provide the details of the frequency bands and quantum of spectrum available in each band required to be put to auction and associated information in respect of space-based communication.

**In response, DoT vide its letter dated 27.11.2021 informed that-
“...information in respect of space-based communication**

services sought by TRAI vide letter dated 23.11.2021, the same will take some time. Therefore, to avoid delay in 5G roll-out, TRAI may go ahead with consultations/recommendations on issues excluding space-based communication services referred in DoT's reference dated 13.09.2021 and 23.09.2021. Issues related to space-based communication services may be taken up separately on receipt of information from DoT".

The information sought by TRAI is awaited from DoT. In this regard, it is to state that the information sought, regarding the details of the frequency bands and quantum of spectrum available in each band, is related to space based communication and not related to IMT/5G.

As sought by DoT, the Authority has given its recommendations on 'Auction of Spectrum in frequency bands identified for IMT/5G' for all the spectrum bands referred by DoT including the frequency range 27.5-28.5 GHz as part of 24.25-28.5 GHz band for IMT/5G. Coexistence of Satellite Earth Station Gateway (Earth to Space) with IMT has also been recommended in 27.5-28.5 GHz frequency range.

However, it is for the DoT to decide whether frequency range 27.5-28.5 GHz is to be allocated/auctioned for IMT/5G.

- (iv) TRAI has already recommended that the entire available spectrum should be put to auction in the forthcoming auction. Therefore, any additional spectrum that may become available before the forthcoming auction, should be put to auction; thus, the DoT view is in line with the TRAI recommendation in this regard.**

2. Roll-out obligations in 3300-3670 MHz and 24.25-27.5 GHz bands

Para 6.23(a) and 6.24(a) of the TRAI Recommendations

6.23(a) *Band specific minimum roll out obligations for 3300-3670 MHz band for all TSPs i.e., existing as well as the new entrants should be specified as under:*

(i) *Metros LSAs*

<i>Time Period</i>	<i>Roll Out Obligations</i>
<i>By the end of 1st year</i>	<i>Commercial launch of services anywhere in the LSA</i>
<i>By the end of 3rd Year</i>	<i>Cumulative number of sites to be deployed: 2800</i>
<i>By the end of 5th Year</i>	<i>Cumulative number of sites to be deployed: 4600</i>

(ii) *Non-Metro LSAs*

<i>Time Period</i>	<i>Roll Out Obligations</i>
<i>By the end of 1st year</i>	<i>Commercial launch of services in at least 1 city in the LSA</i>
<i>By the end of 3rd Year</i>	<i>Cumulative number of sites to be deployed: Category A LSAs: 7000 Category B LSAs: 4600 Category C LSAs: 2600</i>
<i>By the end of 5th Year</i>	<i>Cumulative number of sites to be deployed (at least 5% of the sites to be in rural SDCA, including economic zones): Category A LSAs: 10000 Category B LSAs: 7000 Category C LSAs: 4700</i>

6.24(a) *Band specific minimum roll out obligations for 24.25-28.5 GHz band for all TSPs i.e., existing as well as the new entrants should be specified as under:*

(i) *Metros LSAs*

<i>Time Period</i>	<i>Roll Out Obligations</i>
<i>By the end of 1st year</i>	<i>Commercial launch of services anywhere in the LSA</i>
<i>By the end of 3rd Year</i>	<i>Cumulative number of sites to be deployed: 900</i>
<i>By the end of 5th Year</i>	<i>Cumulative number of sites to be deployed: 1500</i>

(ii) *Non-Metro LSAs*

<i>Time Period</i>	<i>Roll Out Obligations</i>
<i>By the end of 1st year</i>	<i>Commercial launch of services anywhere in the LSA</i>
<i>By the end of 3rd Year</i>	<i>Cumulative number of sites to be deployed: Category A LSAs: 2400 Category B LSAs: 1500 Category C LSAs: 800</i>
<i>By the end of 5th Year</i>	<i>Cumulative number of sites to be deployed Category A LSAs: 3300 Category B LSAs: 2300 Category C LSAs: 1500</i>

DoT's View

With regard to roll-out obligations in 3300-3670 MHz and 24.25-27.5 GHz bands, DoT is of the view that minimum roll out obligations should be applicable in a combined manner to 3300-3670 MHz band and 24.25-27.5 GHz band. i.e., the no. of sites to be deployed in LSAs should be a combined target for these two bands. Therefore, a combined target for no. of sites to be deployed with reference to TRAI recommendations 6.23 and 6.24 for combined bands of 3300-3670 MHz band and 24.25-27.5 GHz band may be as follows:

(i) Metros LSAs

Time Period	Roll Out Obligations
By the end of 1 st year	Commercial launch of services anywhere in the LSA
By the end of 3 rd Year	Cumulative number of sites to be deployed: 2800
By the end of 5 th Year	Cumulative number of sites to be deployed: 4600

(ii) Non-Metro LSAs

Time Period	Roll Out Obligations
By the end of 1 st year	Commercial launch of services in at least 1 city in the LSA
By the end of 3 rd Year	Cumulative number of sites to be deployed: Category A LSAs: 1400 Category B LSAs: 900 Category C LSAs: 500
By the end of 5 th Year	Cumulative number of sites to be deployed (at least 5% of the sites to be in rural SDCA, including economic zones): Category A LSAs: 2000 Category B LSAs: 1400 Category C LSAs: 1100

Response of TRAI

DoT has viewed that minimum roll out obligations should be applicable in a combined manner to 3300-3670 MHz band and 24.25-27.5 GHz band and has also proposed the number of sites to be deployed in LSAs as a combined target for these two bands. It is observed that DoT has not provided reasons/justification for combining roll out obligation and the proposed combined target of

the number of sites to be deployed for 3300-3670 MHz band and 24.25-27.5 GHz band.

It is noted that spectrum bands 3300-3670 MHz and 24.25-27.5 GHz will not be auctioned in a bundled manner i.e., will be auctioned separately in the forthcoming auction. Technical characteristics of these two bands are quite different and use cases likely to be deployed using these spectrum bands are also likely to be different. Possibility of a bidder acquiring spectrum in only one of these bands and not in both the bands, cannot be ruled out. Imposing combined roll out conditions on a TSP acquiring spectrum in one of these bands will not be justifiable. Moreover, combined minimum roll out obligations may also open doors for hoarding of spectrum in one of these spectrum bands, leading to underutilization of valuable natural resource viz. spectrum. The objective of prescribing minimum roll out obligation is to ensure that spectrum is put to use at the earliest and benefit starts deriving by way of offering services to fulfil the needs of the subscribers (individuals as well as enterprises), leading to overall economic growth of the country.

In view of the above, the Authority is of the view that separate band-specific minimum roll out obligations as recommended by the Authority, vide para numbers 6.23(a) and 6.24(a) in its recommendations dated 11th April 2022, should be prescribed for 3300-3670 MHz and 24.25-27.5 GHz bands.

3. Process for regular conduct of spectrum auction

Para 6.42 of the TRAI recommendations

6.42 As there will be regular conduct of spectrum auctions on annual basis (or at shorter intervals), the Authority recommends that

- (I) *For existing bands (including for the bands being put to auction for the first time in the forthcoming auction), a fresh spectrum valuation exercise be conducted once every three years; a suitable reference be made to the Authority by Government for this purpose.*
- (II) *For auctions conducted in the interim period between periodic valuation exercises conducted once every three years,*
- (1) for LSAs where the spectrum put to auction in a previous auction is sold, the auction determined prices (duly indexed using applicable MCLR if more than one year has elapsed since the previous auction) should be used for arriving at the reserve prices for the next auction;*
- (2) for LSAs, where spectrum remains unsold in previous auctions, past recommended reserve price (without indexation) should be used.*
- (III) *For new spectrum bands, to be put to auction for first time, a reference be sent to the Authority, as per established procedure as and when these bands are proposed to be put to auction.*
- (IV) *However, if required, DoT may seek fresh reserve prices from the Authority for the existing bands, providing a full and reasoned justification for the same.*

DoT's View

DoT is of the view that given the fast-changing techno-commercial ecosystem, spectrum valuation at shorter intervals may be desirable. For instance, in LSAs/bands where spectrum remains unsold, there could be a case for reduction in reserve prices. Alternatively, there could be a spectrum band which may become more valuable due to a technological break-through.

Hence, it is proposed that recommendations of TRAI on spectrum pricing would be sought before conduct of every auction.

Response of TRAI

DoT, in its letter dated 23.09.2021, *inter alia*, conveyed the Government's decision regarding the regular conduct of spectrum auction on annual basis, normally in the last quarter of every financial year and at shorter intervals whenever necessary. The Authority has, in this context, factored in this Government decision while making the recommendation at paragraph 6.42. The detailed rationale for this recommendation is given at paragraph 3.39 of the Authority's Recommendations dated 11.04.2022. As stated therein, the Authority undertakes spectrum valuation exercises using various models/ approaches that use different datasets of technical, market and economic data, updated periodically. These parameters do not change much in a short time span. At the same time, the Authority had noted that there is a need to evaluate the techno-economic context at regular intervals to reckon for changes. The Authority had also noted in this context that annual valuation exercises may not be necessary.

As such, the Authority does not agree with DoT's proposal to seek the Authority's recommendations before conduct of every (annual/ shorter interval) auction, as this would not be necessary unless DoT comes to a conclusion that the changes in the techno-commercial ecosystem and other factors warrants a fresh valuation. The Authority reiterates its recommendation given at paragraph 6.42 of the Recommendations dated 11.04.2022. As recommended at sub-paragraph (IV) thereof, in case DoT would like to seek the Authority's recommendations for existing spectrum bands in the interim period between periodic valuation exercises conducted once every three years, it may do so with a full and reasoned justification for the same. For new spectrum bands to be

put to auction for the first time, the recommendation at subparagraph (III) of paragraph 6.42 would be applicable.

4. Reserve Price in 24.25-27.5 GHz band

Para 6.50, 6.51 of the TRAI recommendations

6.1 The Authority recommends that the reserve price of the spectrum in the 24.25 GHz – 28.5 GHz band should be set at 70% of the valuation arrived at.

6.2 Accordingly, the recommended reserve price of 24.25 – 28.5 GHz band for each LSA, is tabulated below:

TABLE 3.18: RECOMMENDED RESERVE PRICE PER MHZ
IN 24.25 – 28.5 GHz BAND (UNPAIRED)
(20 years)

(in Rs.)			
(1)	(2)	(3)	(4)
LSA	Category	Reserve Price (as calculated)	Recommended Reserve Price (Rounded off)
Delhi	Metro	88.97 lakh	89 lakh
Kolkata	Metro	31.91 lakh	32 lakh
Mumbai	Metro	77.93 lakh	78 lakh
Andhra Pradesh	A	56.62 lakh	57 lakh
Gujarat	A	49.64 lakh	50 lakh
Karnataka	A	39.89 lakh	40 lakh
Maharashtra	A	62.81 lakh	63 lakh
Tamilnadu	A	46.39 lakh	46 lakh
Haryana	B	13.39 lakh	13 lakh
Kerala	B	19.17 lakh	19 lakh
Madhya Pradesh	B	29.02 lakh	29 lakh
Punjab	B	20.18 lakh	20 lakh
Rajasthan	B	24.71 lakh	25 lakh
U. P. (East)	B	30.05 lakh	30 lakh
U.P. (West)	B	28.67 lakh	29 lakh
West Bengal	B	19.00 lakh	19 lakh
Assam	C	10.48 lakh	10 lakh
Bihar	C	26.98 lakh	27 lakh
Himachal Pradesh	C	4.77 lakh	5 lakh
Jammu & Kashmir	C	3.00 lakh	3 lakh

<i>North East</i>	<i>C</i>	<i>2.80 lakh</i>	<i>3 lakh</i>
<i>Orissa</i>	<i>C</i>	<i>11.59 lakh</i>	<i>12 lakh</i>

DoT's View

As mentioned in para 1(iii) above, DoT is of the view that the auction of spectrum band 27.5-28.5 GHz may be deferred pending TRAI recommendations relating to para 7(c) of DoT reference dated 13.09.2021 regarding auction of spectrum for space based communication services. Therefore, TRAI may clarify whether the reserve price recommended for 24.25-28.5 GHz band can also be applied for 24.25-27.5 GHz frequency range.

Response of TRAI

The methodology for arriving at the reserve price for the spectrum in the mmWave band (24.25-28.5 GHz) is given at paragraphs 3.188 to 3.194 of the Authority's Recommendations dated 11.04.2022. In this view, the reserve price recommended for 24.25-28.5 GHz band can also be applied in case of 24.25-27.5 GHz frequency range.

CHAPTER-III: VIEWS ON ANNEXURE-II

Views of the Authority on some of the views of DoT listed in Annexure-II to the back reference

5. Block Size for new band

Para 6.16, 6.17, 6.18 of the TRAI Recommendations

6.16 The Authority recommends that considering the global trend and to provide flexibility to the TSPs, block size of 5 MHz should be prescribed for 600 MHz band.

6.17 The Authority recommends that for 3300-3670 MHz band block size of 10 MHz should be prescribed. Further, DoT should ensure that if a TSP acquires more than one block, entire spectrum assigned to a TSP is in contiguous form.

6.18 The Authority recommends that Block size for 24.25-28.5 GHz band be kept as 50 MHz. Further, DoT should ensure that if a TSP acquires more than one block, entire spectrum assigned to a TSP is in contiguous form.

DoT's View

These TRAI recommendations may be accepted. Further, minimum amount to bid for by a bidder may be taken as 1 block.

Views of TRAI

TRAI while recommending the block size, had not recommended any minimum number of blocks for bidding, which implies that the minimum number of blocks for a bidder would be 1 block. Therefore, the views of DoT are as per the TRAI recommendations in this regard.

6. Provision for Network Service Provider for participation in the auction

Para 6.19 of the TRAI Recommendations

6.19 The Authority recommends that DoT should take a decision on the TRAI recommendations on “Enabling Unbundling of Different Layers Through Differential Licensing” of August 2021 at the earliest, preferably before conducting the Auction and make suitable provision for Network Service Provider (similar to Access Service providers) in the NIA under eligibility criteria for participating in Auction and other related clauses such as spectrum sharing, spectrum trading, etc.

DoT’s View

This TRAI recommendation requires further work within DoT.

Views of TRAI

The Authority reiterates its recommendation.

7. Accounting of VNO networks for roll-out

Para 6.25 of the TRAI recommendations

6.25 The Authority recommends that while assessing the fulfilment of roll out obligations of Access Network provider, the network elements (such as BTS, BSC etc.), created by the attached VNO(s) should also be included.

DoT’s View

This recommendation may not be applicable for the upcoming spectrum auction, in view of DoT's views on TRAI rec 6.19 (reference para 6 above).

Views of TRAI

It has been recommended that for fulfilment of roll out obligations of Access Network provider, the networks elements created by the attached VNO(s) should also be included.

VNOs parent to Network Service Operators (NSOs) for providing the Service authorized under the License agreement. Access Service Providers are also working as NSOs providing their resources to VNOs. The VNOs are permitted to establish BTSs. Therefore, the network elements such BTS, BSC etc. created by the attached VNO should also be counted towards fulfilment of minimum roll out obligations of parent NSO (Unified licensee with Access Service authorization and Access Network Provider-as recommended by TRAI).

The Authority is of the view that DoT should consider creating suitable provisions in the NIA for accounting of the network elements (such BTS, BSC etc.), created by the attached VNO(s) while assessing minimum roll out obligations of parent NSO (that is, Unified licensee with Access Service authorization and Access Network Provider-as recommended by TRAI vide its recommendations on “Enabling Unbundling of Different Layers Through Differential Licensing” of August 2021).

11. TRAI recommendations on 'Enhancement of Scope of IP-1 registrations dated 13.03.2020

Para 6.38 of the TRAI Recommendations

6.38 The Authority is of the view that the Department of Telecommunications should take the decision on the recommendations made in 'Enhancement of Scope of Infrastructure Providers Category-I (IP-1) Registration', dated 13th March 2020 at the earliest.

DoT's View

This recommendation is being dealt with separately and requires further work within DoT.

Views of TRAI

The Authority is of the view that an early decision is desirable.

12. Reserve Price and validity

Para 6.40 of the TRAI Recommendations

6.40 The Authority recommends that the reserve price of spectrum allocation in case of 30 years should be equal to 1.5 times (one-and-a-half times) the reserve price of spectrum allocation for 20 years for the respective band.

DoT's View

TRAI has conducted valuation exercise to arrive at Reserve Prices, for an allocation period of 20 years as done in previous exercises and recommendations. Therefore, validity period for spectrum assignment through upcoming auction may be 20 years.

Views of TRAI

The Authority's recommendation at paragraph 6.40 was given pursuant to the Government's decision conveyed in DoT's letter dated 23.09.2021 regarding the increase in duration of spectrum assignment to 30 years (from 20 years previously) for future auctions. Duly factoring in this Government decision, the Authority, after an analysis of the relevant factors, recommended (at paragraph 6.40) that the reserve price of spectrum allocation in case of 30 years should be equal to 1.5 times (one-and-a-half times) the reserve price of spectrum allocation for 20 years for the respective band. The reasons and rationale for this

recommendation are detailed at paragraph 3.7 to 3.22 of the Recommendations dated 11.04.2022, under the sub-heading: Increase in duration of spectrum allocation. Therein, the Authority had, *inter alia*, reasoned that the valuation of spectrum for the increased allocation period of 30 years should be proportionately higher than the valuation of the same spectrum for an allocation period of 20 years. After arriving at the reserve price by conducting the valuation exercise for an allocation period of 20 years, the reserve price is to be proportionately increased to reckon for the increased duration of 30 years. Further, while recommending payment terms, the Authority has considered a 30 year period for different payment options.

However, it is for the DoT to decide upon the validity period of spectrum assignment through the auction.

15. Private Captive Network (Para 6.54 to 6.71 of the TRAI the recommendations)

DoT's View

TRAI, in recommendations 6.54 to 6.71, has recommended provisions for meeting spectrum requirements of Private Captive Networks and also licensing for such networks.

TRAI's recommendations on Captive Wireless Private Networks (CWPNs) require further study of ecosystem including demand assessment, business models, implementation framework, etc. Therefore, these TRAI recommendations on Private Captive Networks may be considered at a later stage. However, as the successful bidders of the auction who already have Access Service authorization or would obtain Access Service authorization under the Unified License, the following provisions may be made for the Access Service providers in accordance with the TRAI recommendation 6.54, for the sake of clarity to the bidders in the forthcoming spectrum auction:

a. Access Service providers may provide private network as a service to an enterprise by using network resources (such as through network slicing) over its PLMN public network. Accordingly, specific provisions would be made in the License.

b. Access Service providers may establish isolated Captive non-public network for the enterprises using IMT spectrum acquired by them. Enabling provisions would be incorporated in the License/ Notice Inviting Applications (NIA) for Auction of Spectrum to permit the Access Service Licensee to set-up private network, also known as Non-Public Network (which is isolated from public network), using the IMT spectrum assigned to it for establishing PLMN.

c. It would be clearly mentioned that it will be the responsibility of the TSP to ensure that the prescribed QoS to their customers through public network is maintained, including interference-free co-existence of the public and private networks.

Accordingly, TRAI recommendation 6.54 may be accepted and recommendations 6.55 to 6.71 require further study of ecosystem including demand assessment, business models, implementation framework etc.

Views of TRAI

TRAI in its recommendations, had recommended the following four ways for meeting the demand of entities/enterprises/industries for private cellular network:

- (i) Enterprise may use a Network Slice from TSP's PLMN network.**
- (ii) Enterprise may request TSPs to establish an independent isolated private network in enterprise's premises using the TSP's spectrum.**

- (iii) Enterprise may obtain the spectrum on lease from TSPs and establish their own isolated Captive Wireless Private Network.**
- (iv) Enterprise may obtain the spectrum directly from DoT and establish their own isolated Captive Wireless Private Network.**

DoT in its views has mentioned that provisions may be made for the Access Service Providers for the first two ways i.e., (i) use of network slice from TSP's PLMN network and (ii) TSPs may establish an independent isolated private network in enterprise's premises using the TSP's spectrum, recommended vide para 6.54. For rest of the TRAI recommendations (para 6.55 to 6.71), DoT is of the view that TRAI's recommendations on Captive Wireless Private Networks (CWPNs) require further study of ecosystem including demand assessment, business models, implementation framework, etc. Therefore, these TRAI recommendations on Private Captive Networks may be considered at a later stage.

The Authority is of the view that while demand assessment is required for the last option i.e., Enterprises to obtain the spectrum directly from DoT for establishing their own isolated Captive Wireless Private Network, it is not required for the third option i.e., enterprise to obtain the spectrum on lease from TSPs and establish their own isolated Captive Wireless Private Network. Further, the third option of leasing of spectrum is essential to meet the demand for private networks. The leasing option can be implemented now itself. Therefore, the Authority is of the view that to realize the economic benefit likely to be achieved by implementation of Industry 4.0, third option of spectrum leasing by TSP to CWPN licensees (recommended vide para 6.55 to para 6.59) may also be permitted along with the first two options.

Annexure

Government of India
Ministry of Communications
Department of Telecommunications
Wireless Planning & Coordination Wing

6th floor, Sanchar Bhawan,
20, Ashoka Road, New Delhi-110001.

No.: L-14010/01/2022-NTG

Date: 29.04.2022

To

The Secretary
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg (Old Minto Road)
New Delhi - 110002.

Subject: Back reference on TRAI recommendations dated 11th April 2022 on Auction of Spectrum in frequency bands identified for IMT / 5G - regarding.

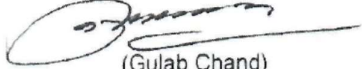
Sir,

The undersigned is directed to refer to TRAI letter No. R-24/2(2)/2022-NSL-II dated 11th April 2022 vide which recommendations on "Auction of Spectrum in frequency bands identified for IMT/5G" were forwarded to Secretary (T), DoT and to state that the above said recommendations of TRAI were considered by the Department of Telecommunications (DoT). It has therefore been decided as follows:

- (i) There is a need to seek reconsidered recommendations from TRAI in respect of some of the recommendations. Such recommendations and the issues involved therein are enclosed as **Annexure-I**.
- (ii) On some of the recommendations, views of the DoT are enclosed as **Annexure-II**.
- (iii) Rest of the recommendations are acceptable.

2. In view of the above, TRAI is requested to provide reconsidered recommendations, in accordance with the provisions of Section 11 of the TRAI Act 1997, as amended in 2000, on recommendations listed in Annexure-I.

Encl: As above.


(Gulab Chand)
Joint Wireless Adviser

**Issues for reconsideration of TRAI arising from its recommendations dated
11th April 2022 on Auction of Spectrum in frequency bands identified for
IMT/5G**

1. Spectrum availability for forthcoming auction of Spectrum (Para 6.14 of the TRAI recommendations):

- (i) DoT is of the view that taking into account recent policy decisions on allocation of spectrum to strategic sector PSU, i.e., BSNL and considering the request of BSNL, following spectrum may be reserved for BSNL in all the 22 LSAs and be excluded from the spectrum availability for upcoming auction:
 - a. 10 MHz (paired) i.e. 612-622/ 663-673 MHz;
 - b. 40 MHz i.e. 3630-3670 MHz;
 - c. 400 MHz i.e. 24.25-24.65 GHz.
- (ii) Request of NCRTC for assignment of 5 MHz (paired) spectrum in 700 MHz band for their LTE-based RRTS system is separately under process in the Department. DoT has sought recommendations of TRAI on spectrum requirements of NCRTC and sharing of same spectrum with other RRTS/metro rail networks. Accordingly, 5 MHz (paired) quantum in 700 MHz band may be reserved in 700 MHz band and not included in the spectrum availability for the forthcoming auction.
- (iii) With regard to spectrum availability in 24.25-28.5 GHz band, DoT is of the view that the auction of spectrum band 27.5-28.5 GHz may be deferred pending TRAI recommendations relating to para 7(c) of DoT reference dated 13.09.2021 regarding auction of spectrum for Space based communication services. Accordingly, spectrum availability for the forthcoming auction may be reduced for upcoming spectrum auction.
- (iv) In case of surrender of spectrum by the TSPs, and spectrum reverting back to the Government from the TSPs in Corporate Insolvency Resolution Process (CIRP) etc. before the auction, total spectrum availability may vary to that extent and such spectrum may also be put to auction.

Subject to the above, entire available quantum of spectrum in 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz, 24.25-27.5 GHz bands, at the time of publication of the Notice Inviting Applications (NIA) for the forthcoming auction may be put to auction.

2. Roll-out obligations in 3300-3670 MHz and 24.25-27.5 GHz bands (Para 6.23(a), 6.24(a) of the TRAI recommendations):

With regard to roll-out obligations in 3300-3670 MHz and 24.25-27.5 GHz bands, DoT is of the view that minimum roll out obligations should be applicable in a combined manner to 3300-3670 MHz band and 24.25-27.5 GHz band. i.e. the no. of sites to be deployed in LSAs should be a combined target for these two bands. Therefore, a combined target for no. of sites to be deployed with reference to TRAI recommendations 6.23 and 6.24 for combined bands of 3300-3670 MHz band and 24.25-27.5 GHz band may be as follows:

(a) Metros LSAs

Time Period	Roll Out Obligations
By the end of 1st year	Commercial launch of services anywhere in the LSA
By the end of 3rd Year	Cumulative number of sites to be deployed: 2800
By the end of 5th Year	Cumulative number of sites to be deployed: 4600

(b) Non-Metro LSAs

Time Period	Roll Out Obligations
By the end of 1st year	Commercial launch of services in at least 1 city in the LSA
By the end of 3rd Year	Cumulative number of sites to be deployed: Category A LSAs: 1400 Category B LSAs: 900 Category C LSAs: 500
By the end of 5th Year	Cumulative number of sites to be deployed (at least 5% of the sites to be in rural SDCA, including economic zones): Category A LSAs: 2000 Category B LSAs: 1400 Category C LSAs: 1100

3. Process for regular conduct of spectrum auction (Para 6.42 of the TRAI recommendations):

DoT is of the view that given the fast-changing techno-commercial ecosystem, spectrum valuation at shorter intervals may be desirable. For instance, in LSAs/bands where spectrum remains unsold, there could be a case for reduction in reserve prices. Alternatively, there could be a spectrum band which may become more valuable due to a technological break-through.

Hence, it is proposed that recommendations of TRAI on spectrum pricing would be sought before conduct of every auction.

4. Reserve Price in 24.25-27.5 GHz band (Para 6.50, 6.51 of the TRAI recommendations):

As mentioned in para 1(iii) above, DoT is of the view that the auction of spectrum band 27.5-28.5 GHz may be deferred pending TRAI recommendations relating to para 7(c) of DoT reference dated 13.09.2021 regarding auction of spectrum for Space based communication services. Therefore, TRAI may clarify whether the reserve price recommended for 24.25-28.5 GHz band can also be applied for 24.25-27.5 GHz frequency range.

DoT views on certain TRAI recommendations dated 11th April 2022 on Auction of Spectrum in frequency bands identified for IMT/5G

1. Spectrum availability in 526-698 MHz band (Para 6.1(b), 6.1(c), 6.1(d) and 6.1(f) of the TRAI recommendations):

These TRAI recommendations require further work within DoT.

2. Band Plan in 526-698 MHz band (Para 6.2 of the TRAI recommendations):

Taking into account recent policy decisions on allocation of spectrum to strategic sector PSU, i.e., BSNL and considering the request of BSNL, in 600 MHz band, 10 MHz (paired) spectrum i.e. 612-622/ 663-673 MHz may be reserved for BSNL in all the 22 LSAs and be excluded from the spectrum availability for upcoming auction. Accordingly, 30 MHz (paired) spectrum [622-652 MHz/673-703 MHz] may be put to auction in 600 MHz band in the forthcoming auction.

3. Band Plan and Spectrum Availability in 24.25-28.5 GHz band (Para 6.6, 6.7 of the TRAI recommendations):

Spectrum band 24.25-27.5 GHz may be put to auction with the flexibility to TSP adopt any band plan i.e., n257 or n258. However, auction of spectrum band 27.5-28.5 GHz may be deferred pending TRAI recommendations relating to para 7(c) of DoT reference dated 13.09.2021 regarding auction of spectrum for Space based communication services.

4. Spectrum availability in 800 MHz band (Para 6.9(a) of the TRAI recommendations):

Part of the recommendation relating to conduct of field trials may be accepted. In view of optimal spectrum utilization and revenue realization, Auction of all 16 blocks and the conduct of field trials may be carried out simultaneously. Therefore, following provisions may be included in the NIA:

(i) Till the outcome of the trials, the guard band between 800 MHz and 900 MHz bands shall be kept at the existing level i.e. 1.6 MHz;

(ii) To ensure the requirement mentioned in (i) above, the actual assignment in block 887.75-889 MHz shall be restricted to 887.75-888.5 MHz;

(iii) During the harmonization process, the choice of last block i.e. 887.75-888.5 MHz shall be given to the higher rank bidder in the band-LSA combination;

(iv) Charging of the last block will be done on pro-rata basis;

(v) In case field trials show that the guard band of about 1 MHz between 800 MHz and 900 MHz bands is sufficient for interference-free co-existence of

assignees in these two bands, the last block i.e. 887.75-888.5 MHz will be converted into 887.75-889 MHz and accordingly will be charged on pro-rata basis.

The field trials may be concluded not later than 3 months from the completion of the auction.

5. Block Size for new bands (Para 6.16, 6.17, 6.18 of the TRAI recommendations):

These TRAI recommendations may be accepted. Further, minimum amount to bid for by a bidder may be taken as 1 block.

6. Provision for Network Service Provider for participation in the auction (Para 6.19 of the TRAI recommendations):

This TRAI recommendation requires further work within DoT.

7. Accounting of VNO networks for roll-out obligations (Para 6.25 of the TRAI recommendations):

This recommendation may not be applicable for the upcoming spectrum auction, in view of DoT's views on TRAI rec 6.19 (reference para 6 above).

8. Spectrum caps (Para 6.26, 6.27, 6.28 of the TRAI recommendations):

Applicability of band-specific cap on the total spectrum put to auction may be applied on mid-band and mmWave band only. For other two band groups i.e. for sub-1GHz bands (600 MHz (APT 600 Option B1), 700 MHz, 800 MHz and 900 MHz) and for 1800/2100/2300/2500 MHz bands, caps may be made applicable on the respective combined spectrum holding in these band groups, including existing spectrum holdings of TSPs and also in line with the practice followed in the last auction conducted in March-2021. In view of para 1 of Annexure-I above regarding reservation of spectrum, spectrum caps may be calculated after excluding the reservation of spectrum. Spectrum cap norms may be published with clarity in the NIA for the forthcoming auction.

9. Surrender of existing spectrum holding of TSPs, acquired through past auctions (Para 6.33 of the TRAI recommendations):

This TRAI recommendation requires further work within DoT.

10. Application processing fee for surrender of spectrum (Para 6.34 of the TRAI recommendations):

Noting TRAI's observation that surrender fee should not be kept high to make the provision ineffective, a nominal processing fee @ Rs. 1,000 (Rupee One thousand) per spectrum band per LSA may be charged for surrender.

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11. TRAI recommendations on 'Enhancement of Scope of IP-I registrations' dated 13.03.2020 (Para 6.38 of the TRAI recommendations):

This recommendation is being dealt with separately and requires further work within DoT.

12. Reserve Price and validity (Para 6.40 of the TRAI recommendations):

TRAI has conducted valuation exercise to arrive at Reserve Prices, for an allocation period of 20 years as done in previous exercises and recommendations. Therefore, validity period for spectrum assignment through upcoming auction may be 20 years.

13. Payment methodology for partial spectrum (Para 6.52 of the TRAI recommendations):

As per existing methodology, bid amounts for spectrum available in part of the LSAs are collected based on population based pro-rata calculations. Indexing may be made only if the actual assignment is done after 1 year from the auction completion date, on the similar lines with Spectrum Liberalization guidelines and Spectrum Trading guidelines of DoT. The rate of indexing the price may be revised from existing practice of SBI PLR to MCLR prevalent for the period between finalization of bid price and actual assignment made.

14. Payment terms (Para 6.53 of the TRAI recommendations):

TRAI has conducted valuation exercise to arrive at Reserve Prices, for an allocation period of 20 years as done in previous exercises and recommendations. In view of the above, validity period for spectrum assignment through upcoming auction may be 20 years. Accordingly, Option II of the Payment Terms recommended by TRAI may be accepted with slight modification as given below:

"Option II: Payment of **20** equal annual instalments of the bid amount (duly protecting the net present value of the bid amount at the applicable rate of interest) in advance at the beginning of the year, the first instalment becoming payable within 10 days of declaration of final price. The balance **19** instalments shall become due and payable on the same date of each following year."

Further, TRAI has recommended for protecting NPV with the "applicable rate of interest". In past auctions, the rate of interest applied was SBI base rate as on date of publication of the NIA. Since the intention is to encourage participation in the auction and acquiring spectrum, through relatively eased up payment terms, the interest rate applicable shall be decided by DoT subsequently.



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15. Private Captive Networks (Para 6.54 to 6.71 of the TRAI recommendations):

TRAI, in recommendations 6.54 to 6.71, has recommended provisions for meeting spectrum requirements of Private Captive Networks and also licensing for such networks.

TRAI's recommendations on Captive Wireless Private Networks (CWPNs) require further study of ecosystem including demand assessment, business models, implementation framework, etc. Therefore, these TRAI recommendations on Private Captive Networks may be considered at a later stage. However, as the successful bidders of the auction who already have Access Service authorization or would obtain Access Service authorization under the Unified License, the following provisions may be made for the Access Service providers in accordance with the TRAI recommendation 6.54, for the sake of clarity to the bidders in the forthcoming spectrum auction:

- a. Access Service providers may provide private network as a service to an enterprise by using network resources (such as through network slicing) over its PLMN public network. Accordingly, specific provisions would be made in the License.
- b. Access Service providers may establish isolated Captive non-public network for the enterprises using IMT spectrum acquired by them. Enabling provisions would be incorporated in the License/ Notice Inviting Applications (NIA) for Auction of Spectrum to permit the Access Service Licensee to set-up private network, also known as Non-Public Network (which is isolated from public network), using the IMT spectrum assigned to it for establishing PLMN.
- c. It would be clearly mentioned that it will be the responsibility of the TSP to ensure that the prescribed QoS to their customers through public network is maintained, including interference-free co-existence of the public and private networks.

Accordingly, TRAI recommendation 6.54 may be accepted and recommendations 6.55 to 6.71 require further study of ecosystem including demand assessment, business models, implementation framework, etc.



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